REMARKS

Claims 1 through 8 are pending in this application. Claims 1, 6, and 8 have been amended by this Preliminary Amendment.

Prior Claim Objection under 35 U.S.C. § 112

Claim 6 was previously objected to because of the informalities pointed out by the Examiner, by which the fourth and eighth means appeared to be the same. Claim 6 has been amended to clarify that the fourth and eighth means are intended to be different, since the eighth means operates only after the seventh means has written new data/information. It is therefore submitted that claim 6 has now been amended to overcome the Examiner's § 112 objection.

Prior Claim Rejection Under 35 U.S.C. § 102

Claims 1, 2, and 6 through 8 were previously rejected under 35 U.S.C. § 102(e) for alleged anticipation by Jones U.S. Patent No. 5,572,660. Claims 1, 6, and 8 have been further amended to emphasize that the instant inventor Lee teaches a device in which a unique one cache corresponds to a unique one disk, unlike Jones, who does not disclose such one-to-one caching. Therefore, it is submitted that Jones does not anticipate the instant invention, since Jones does not disclose each and every element and limitation of these claims.

As to claim 2, it depends from claim 1 and therefore incorporates by reference the

limitation referred to in the preceding paragraph.

As to method claim 7, its last step is "*the improvement comprising* a step for reducing overhead during a read operation for data recovery and thereby improving data input-output performance." This is a step-plus-function claim. Accordingly, the specification acts as a glossary for the claim. *Chiuminatta Concrete Concepts v. Cardinal Indus., Inc.,* 145 F.3d 1303, 46 U.S.P.Q.2d 1752 (Fed. Cir. 1997). The acts and structure of the part of the specification corresponding to the recited function (i.e., "reducing overhead during a read operation for data recovery and thereby improving data input-output performance") are incorporated by reference into claim 7. *Id.*

As stated in the original specification, it is an object of Lee's invention to provide a RAID system capable of "reducing overhead during a read operation of data recovery information in order to improve its data input/output performance" (p. 7). As explained in the specification (pp. 11-12), Lee's invention couples each one of a plurality of caches to a unique disk and goes through the steps of the claimed method while, among other things, maintaining the foregoing unique one cache to unique one disk relationship, unlike prior art devices such as Jones.

There has been no finding that the acts and structure involved in the Jones method and device are identical to those of Lee's specification or an equivalent thereof. Absent such a finding (which must be supported by substantial evidence, *In re Gartside,* 203 F.3d

1305, 53 USPQ2d 1769 (Fed. Cir. 2000)), a reference cannot anticipate a step-plus-function claim. *In re Donaldson Co.,* 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(en banc); *In re Bond,* 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Therefore, Jones cannot anticipate Lee's claim 7.

Prior Claim Rejection Under 35 U.S.C. § 103

Claims 3 through 5 were previously rejected under 35 U.S.C. § 103(a) for alleged unpatentability over Jones '660 in view of Holland U.S. Patent No. 5,455,934.

a. When an invention is alleged to be obvious from a combination of references, the combination must disclose *all of the elements* of the invention. No claim limitation can be ignored under § 103. *In re Lowry,* 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031 (Fed. Cir. 1994) ("The PTO must consider all claim limitations when determining the patentability of an invention over the prior art.").

In *Al-Site Corp. v. VSI Int'l,* 174 F.3d 1308, 1324, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999), the Federal Circuit held that a claim was not shown to be obvious from the Seaver patent. The reason was that "although the Seaver patent discloses some of the elements recited in the Magnivision patents' claims, it does not disclose the display member, the cantilevered support, or the aperture for mounting the hanger tag on the cantilevered support," and the art of record did not suggest adding those elements to Seaver. Similarly, the Federal Circuit rejected a challenge against an obviousness determination

-10-

where the cited art *did* contain all elements of the invention. *In re Schreiber*, 128 F.3d

1473, 1479, 44 U.S.P.Q.2d 1429 (Fed. Cir. 1997)("Schreiber argues that the combination

of Harz and Fisher does not disclose all the limitations of claim 2 because neither Harz

nor Fisher discloses the functionally defined features of the top. That argument is without

merit because, as we have already noted, Harz discloses those functionally defined

limitations.").

See also *In re Gartside*, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000) ("We

agree with the Commissioner that substantial evidence supports the Board's fact finding

and that the Board correctly concluded that the claims were unpatentable under § 103. As

an initial matter, we agree with the Commissioner that substantial evidence supports the

Board's finding that Gartside's '645 and '235 patents *contain all the limitations set forth* in

claim 47."); *Mitsubishi Electric Corp. v. Ampex Corp.*, 190 F.3d 1300, 1313, 51 U.S.P.Q.

2d 1910 (Fed. Cir. 1999)(upholding § 103 determination because "a reasonable jury could

have concluded that the second Williard article in combination with either the first

Williard article or the Goode and Phillips article provided all of the elements of the

claimed invention"); *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453 (Fed. Cir.

1998)(court stated that it would uphold the part of the Board's § 103 ruling on the point

that the three cited references contained all of the claimed elements: "the Board did not

err in finding that the combination of King, Rosen, and Ruddy contains all of the

elements claimed in Rouffet's application").

Jones and Holland do not disclose one-to-one caching. Accordingly, the preceding remarks about the lack in the cited art of a unique cache and unique disk relationship (and thus no anticipation) are incorporated herein by reference.

b. The § 103 rejection based on combining Jones and Holland is not supported by a specific showing of a teaching, suggestion, or motivation in the prior art to combine Jones and Holland, nor to make the specific adaptations to each needed to combine them. Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Dembiczak,* 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999)(teaching or motivation or suggestion to combine is an "essential evidentiary component of an obviousness holding"); *In re Rouffet,* 149 F.3d 1350, 1355, 47 U.S.P.Q.2d 1453 (Fed. Cir. 1998; *In re Chu,* 66 F.3d 292 (Fed. Cir. 1995); *Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc.,* 21 F.3d 1068, 1072 (Fed. Cir. 1994)("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination."); *In re Jones,* 958 F.2d 347, 351, 21 U.S.P.Q.2d 1941, 1943–44 (Fed. Cir. 1992); *In re Fine,* 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1586, 1589–90 (Fed. Cir.

1988); *In re Geiger,* 815 F.2d 686, 688 (Fed. Cir. 1987); *ACS Hosp. Sys., Inc. v. Montefiore Hosp.,* 732 F.2d 1572, 1577, 221 U.S.P.Q.2d 929, 933 (Fed. Cir. 1984).

"Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability." Doing that is "the essence of hindsight." *In re Dembiczak,* 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). The showing must be "clear and particular." Broad conclusory statements standing alone are not legally sufficient. *Id.* There must be "particular findings regarding the locus of the suggestion, teaching, or motivation to combine the prior art references." *Id.* at 1000. The PTO must explain, as it did not do here, what specific understanding or technical principle would have suggested the combination of references. *Id.; In re Rouffet,* 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1459 (Fed. Cir. 1998).

c.   That it is advantageous to access from the outer track in this context, as the previous office action stated, is not a basis for combining the references. It is just a hindsight use of the instant disclosure to provide the requisite motivation instead of finding the motivation in the prior art. Nothing in the prior art *specifically* teaches, suggests, or motivates combining and adapting the Jones and Holland devices to correspond to the instant structure of Lee, so as to get the benefit of outer track access for accomplishing the purposes of Lee's instant invention.

d. Lee also respectfully notes that the elements of an obviousness analysis as commanded by the Federal Circuit are not found in this record. In *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999), the Federal Circuit overturned an obviousness rejection by the Board because of its failure to make the kind of obviousness legal analysis that the Supreme Court commanded in *Graham v. John Deere Co.*, 376 U.S. 1, 17-18 (1966). Such a legal analysis must begin, the Federal Circuit has consistently held, with making specific findings of fact regarding the level of ordinary skill in the art. Thus the *Dembiczak* decision held that an obviousness rejection must be reversed if, like the instant rejection, it fails to contain "specific findings of fact regarding the level of ordinary skill in the art." 175 F.3d at 1000-01, 50 USPQ2d at 1618. In addition, the findings that the PTO makes on the ordinary level of skill must be supported by substantial evidence of record. *In re Kaplan*, 789 F.2d 1574, 1580, 229 USPQ 678, 683 (Fed. Cir. 1986) ("Even if obviousness of the variation is predicated on the level of skill in the art, prior art evidence is needed to show what that level of skill was."). See also *In re Mayne*, 104 F.3d 1339, 1341, 41 USPQ2d 1451, 1453 (Fed. Cir. 1997) ("The foundational facts for the prima facie case of obviousness are: ... (3) the level of ordinary skill in the art.").
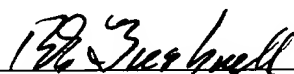
Thus, the rejection in this office action lacks findings and analysis that the Federal Circuit considers essential to support a rejection based on ordinary skill in the art. In

addition, the rejection in office action lacks substantial evidence of record to support such findings, even if they had been made.

e. In view of the above, it is respectfully submitted that the previous § 103 rejection of claims 3 through 5 does not properly apply to said claims, at least as now amended by reason of the amendment of claim 1.

In view of the above, it is submitted that the claims of this application are in condition for allowance, and early issuance thereof is solicited. Should any questions remain unresolved, the Examiner is requested to telephone Lee's attorney.

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-15-

MARKED-UP VERSION OF AMENDMENTS MADE

IN THE CLAIMS

Please amend claims 1, 6, and 8, as follows. All claims are reprinted below for the convenience of the Examiner.

1   1 (four times amended). A memory system, comprising:

2   a plurality of defect-adaptive memory devices, each of said plurality of defect-adaptive

3   memory devices having a first region for sequentially storing parity information

4   for data recovery and a second region for storing data;

5   a plurality of caches, each of said plurality of caches respectively coupled operatively to a

6   corresponding <u>unique</u> one of said plurality of defect-adaptive memory devices,

7   each of said plurality of caches adapted for storing parity information for data

8   recovery for a corresponding <u>unique</u> one of said plurality of defect-adaptive

9   memory devices; and

10   a controller operatively coupled to each defect-adaptive memory device of said plurality

11   of defect-adaptive memory devices and to each corresponding cache of said

12   plurality of caches, said controller comprising a first means for selectively

13   controlling writing and reading of parity information needed for data recovery in

14   said first region of each corresponding one of said plurality of defect-adaptive

15 memory devices, a second means for selectively obtaining parity information

16 needed for data recovery from said first region of each corresponding one of said

17 plurality of defect-adaptive memory devices, and a third means for selectively

18 storing parity information needed for data recovery obtained from said first region

19 of a corresponding one of said plurality of defect-adaptive memory devices in a

20 predetermined corresponding one of said plurality of caches.

1 2 (thrice previously amended, unchanged herein). The memory system of claim 1,

2 wherein said controller comprises a means for determining whether data recovery

3 information is stored in any cache of said plurality of caches.

1 3 (thrice previously amended, unchanged herein). The memory system of claim 1,

2 wherein the parity information needed for data recovery is stored and is sequentially

3 arranged from the most outer cylinder on a recording medium in each corresponding one

4 of said plurality of defect-adaptive memory devices.

1 4 (thrice previously amended, unchanged herein). The memory system of claim 3,

2 wherein parity information for data recovery is modified to a value obtained through a

3 calculation of new data recovery information.

1   5 (thrice previously amended, unchanged herein). The memory system of claim 4,

2   wherein parity information for data recovery is obtained by performing an exclusive-OR

3   operation on previous data, parity information corresponding to the previous data, and

4   new data.

1   6 (four times amended). A redundant array of inexpensive disks (RAID) system,

2   comprising:

3   a plurality of disk drives, each of said plurality of disk drives including a first region

4   having a plurality of data blocks for storing data and a second region having a

5   predetermined number of parity blocks for storing parity information for data

6   recovery;

7   a plurality of caches, each of said plurality of caches respectively coupled operatively to a

8   corresponding unique one of said plurality of disk drives, each of said caches

9   adapted for storing parity information for data recovery; and

10   a controller operatively coupled to each disk drive of said plurality of disk drives and to

11   each corresponding cache of said plurality of caches, said controller adapted for

12   selectively controlling a write operation of data and parity information for a data

13   recovery in each corresponding disk drive of said plurality of disk drives, said

14   controller comprising:

15   a first means for selecting a <u>single</u> predetermined disk drive of said plurality

16   of disk drives upon receipt of a data writing instruction from a host

17   computer;

18   a second means for reading old data from the <u>single</u> predetermined disk

19   drive of said plurality of disk drives;

20   a third means for determining whether old parity information corresponding

21   to the old data corresponding to the <u>single</u> predetermined disk drive

22   of said plurality of disk drives is accessed in a corresponding <u>single</u>

23   cache of said plurality of caches;

24   a fourth means for reading the old parity information from the <u>single</u>

25   predetermined disk drive of said plurality of disk drives, upon the old

26   parity information corresponding to the <u>single</u> predetermined disk

27   drive of said plurality of disk drives not being accessed in the

28   corresponding <u>single</u> cache of said plurality of caches, and for then

29   loading the corresponding <u>single</u> cache of said plurality of caches

30   with the old parity information;

31   a fifth means for obtaining new parity information by performing an

32   exclusive OR operation on the old data, the old parity information

33   and new data;

34   a sixth means for loading the corresponding <u>single</u> cache of said plurality of

35   caches with the new parity information;

36   a seventh means for writing the new data in said region for storing data in

37   the <u>single</u> predetermined disk drive of said plurality of disk drives

38   and writing the new parity information in said another region for

39   storing parity information in the predetermined <u>single</u> disk drive of

40   said plurality of disk drives; and

41   an eighth means for reading old parity information from the <u>single</u> pre-

42   determined disk drive <u>after the seventh means has written new data</u>

43   <u>in said region for storing data and has written the new parity infor-</u>

44   <u>mation in said another region for storing parity information</u>, in the

45   event that no old parity information exists in a corresponding cache,

46   and for then moving said old parity information read from the <u>single</u>

47   predetermined disk drive to the corresponding cache to provide an

48   update of the parity information.

1   7. (unchanged). In a method of writing data to, and reading data from, a

2   redundant array of inexpensive disks (RAID) system, said method comprising steps for

-20-

3   sequentially storing information for data recovery in a first region of a disk, storing

4   information comprising data in a second region of the disk other than the first region,

5   controlling writing and reading of information by means of an electronic controller unit,

6   and caching information for data recovery, *the improvement comprising* a step for

7   reducing overhead during a read operation for data recovery and thereby improving data

8   input-output performance.

1   8 (amended). The method of claim 7, wherein said step for reducing overhead

2   during a read operation for data recovery and thereby improving data input-output

3   performance comprises steps for:

4   (a) coupling each one of a plurality of caches to each corresponding unique one of

5   a plurality of disks, whereby each disk is coupled to one unique cache;

6   (b) operatively coupling the caches to the controller;

7   (c) storing in each unique one of the plurality of caches information for data

8   recovery in the unique one disk corresponding to the unique one cache; and

9   (d) determining information for data recovery in a disk by using information for

10   data recovery stored in the unique one cache corresponding to the unique one disk.